cavagna group

Advanced Solutions for Gas Control

Recreational Vehicles

Gas pressure Regulators & Accessories

LPG VALVES & EQUIPMENT DIVISION

2012 EDITION

RE-01

Recreational vehicles

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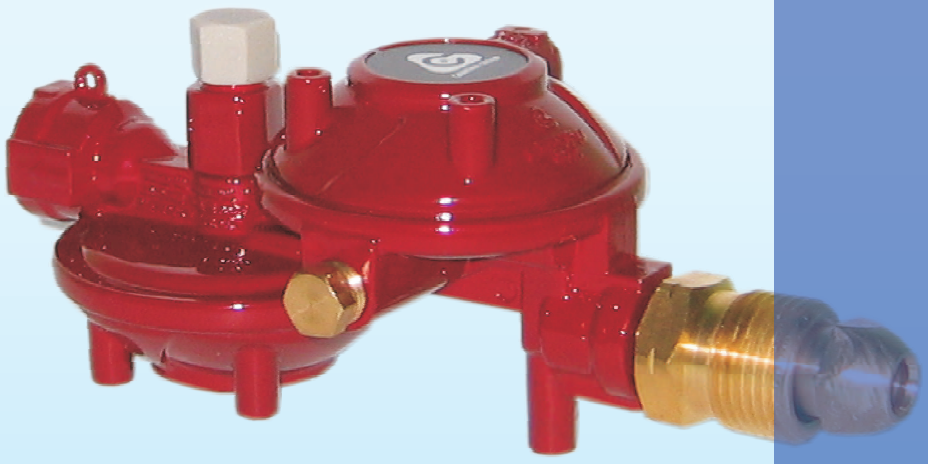
Recreational Vehicles

REGULATORS



1. INTRODUCTION

1.1 Pressure Gas Regulators

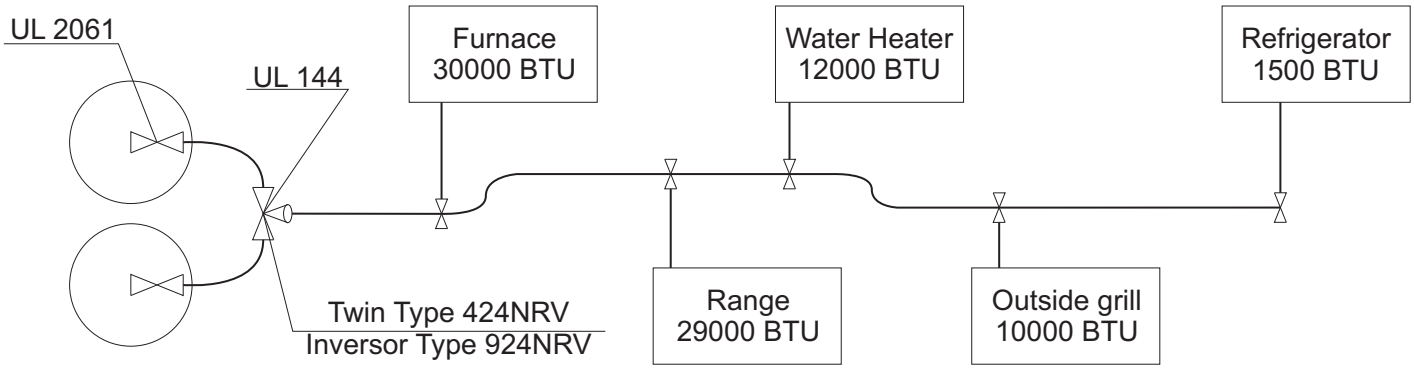
Two stage gas regulators are designed and manufactured in accordance to UL 144 requirements (NFPA 1192; paragraph 5.2.15.2). Regulators are used with propane gas appliances functioning at 11 inch WC pressure.
Gas pressure regulators, used in recreational vehicle (RV) installations, have two integrated stages of regulation with intermediate pressure of 10 PSI (NFPA 1192; paragraph 5.2.15.1).
Depending on the kind of installation these regulators are used for, they can supply gas for a range of calorific power from 100,000 to 160,000 BTU. See technical description of gas appliances.
The second stage of the regulator is equipped with a safety valve Type 1 as per UL 144.

WARNING:
The regulator most be installed with vent hole pointing downwards to allow water to exit.
(See NFPA 1192, paragraph 5.2.15.4).

WARNING:
100 % inspection at Re.Ca. Italy manufacturing unit of the whole range of regulators is undertaken during manufacturing process as far as:
- setting pressure; see setting point at page 6 and 7 of the present catalogue;
- leakage test at the inlet (high pressure value to be used) and leakage test at the outlet (low and high pressure value to be used).

1.2 Installations

RV installations can be made on the basis of the following general diagram:



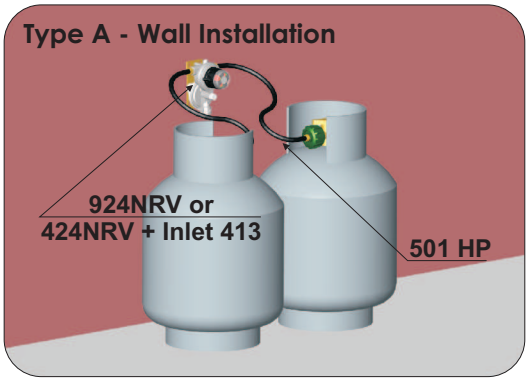
RV installations are supplied by single or double cylinder systems, or by ASME tanks. The integrated second stage regulator is connected to cylinders through flexible high pressure gas rubber hoses, equipped with fittings in accordance to UL 2061 (NFPA 1192; paragraph 5.2.16.4). Installations of integrated double stage regulators have to be in accordance with requirements expressed in NFPA 1192, paragraph 5.2.15.
Installations generally supply the following gas appliances:

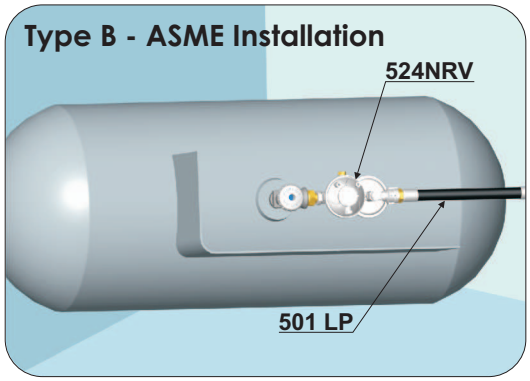
- Furnace	30000 BTU
- Range	29000 BTU
- Water Heater	12000 BTU
- Refrigerator	1500 BTU
- Outside grill	10000 BTU
Total	81000 BTU

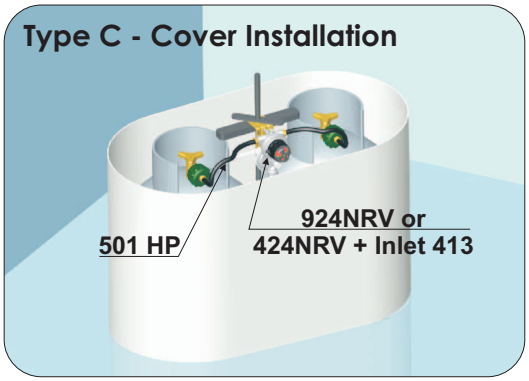
WARNING:
Inside diameter and length of pipes must be calculated to ensure that supplying pressure is sufficient to run the gas appliances at the same time.
All of the above mentioned gas appliances must run at the same time without any failure.

Recreational vehicles

Gas cylinder and regulator shall be protected by a shelter or in a cylindrical cage, see following diagram (as per NFPA 1192, paragraphs 5.2.15.6; 5.2.15.7; 5.2.15.8).







WARNING:
RV gas piping system must be tested for leakage prior to delivering vehicle to dealer network. Therefore, setting pressure test and leakage test have be done by authorized RV OEM. In case of any detected anomalies, the gas regulator kit is not likely to be responsible because the gas regulators are 100% tested while manufacturing.

1.3 Backflow check valve safety device

In accordance with requirements of NFPA 1192, paragraph 5.2.16.3, it is compulsory to have a "backflow check" device for double cylinder installations:

For Two stage group of regulation:
The device consists of a "T" fitting that prevents gas from flowing, in case one of the inlets of the regulator kit is not connected to one of the cylinders.
WARNING:
If a simple "T" fitting is used, it is obligatory to use flexible hoses equipped with "backflow check" device.

For automatic changeover:
The "Backflow Check" device can be integrated into the automatic changeover to prevent gas from flowing, in case one of its inlets is not connected to the cylinder.
WARNING:
If the automatic changeover is not equipped with "backflow check" device, it is obligatory that the «backflow check» device be provided with flexible hoses.

2. Two Stage Range - Type 424 NRV

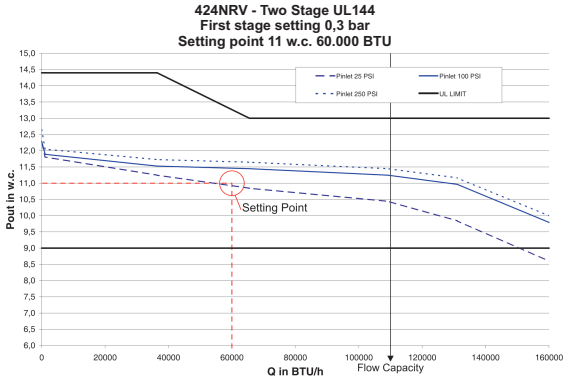
424NRV Type

Cover installation

Depending on the type of installation the basic model can be equipped either with a mounting bracket for "wall installation", type A on page 5, or with a mounting bracket for "cover installation", type C on page 5. In general plastic protection is necessary in first and second stage of regulator for all types of installations.
In double cylinder installations it is necessary to couple the "T" inlet of the backflow check device. See Accessories at page 10.

WARNING:
User manual is obligatory in case the regulator is directly sold to end user. RV OEM must integrate their technical documentation with the provided instruction sheet.
The Two Stage regulator, Type 424 NRV, is connected to the RV through a flexible hose 501 LP Type. See Accessories at page 10.

Wall installation



Technical features:

Inlet connection:	1/4 NPT
Outlet connection:	3/8 NPT
Test Point:	1/8 NPT
Guaranteed Flow:	103000 BTU/h
Setting Point:	11 WC +/- 1 at 60000 BTU
Adjustable outlet pressure:	from -1 WC to +2 WC
Paint:	metallic grey
Cover and body:	Zamak Alloy 13 EN 1774

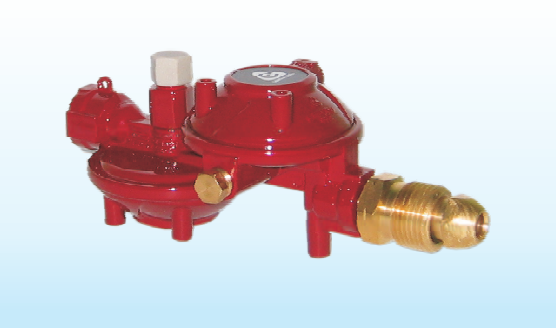
Type	Bracket Model	
424NRV	**1**	Wall Model
	2	Model L

How to order 424 NRV TYPE:
Please combine the codes from the above grid together, as follows:
Type + bracket model. E.g.:

424NRV - 2

3. ASME Range - Type 524AS

524AS Type



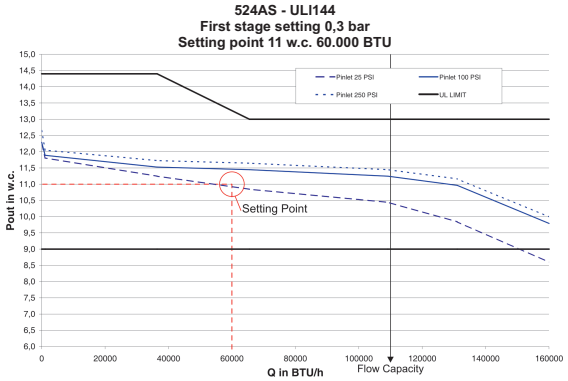
The Two Stage Type 524 AS regulator is mounted directly to tank, connected to the tank valve of ASME container type. It is connected at its outlet to the installation gas pipe net. The regulator inlet POL coupling is equipped with an excess flow valve device.

WARNING:

The regulator must be mounted with vent holes pointing downward. The cover 211-086 (see page 10) is normally mounted as protection for the regulator. See type C installation.

Technical features:

Inlet connection:	POL.880
Outlet connection:	3/8 NPT
Test Point:	1/8 NPT
Guaranteed Flow:	103000 BTU/h
Setting Point:	11 WC +/- 1 at 70000 BTU
Adjustable outlet pressure:	from -0.5 WC to +1.5 WC
Paint:	metallic grey
Cover and body:	Zamak Alloy 13 EN 1774



4. Automatic Changeover Range - Type 924 NRV

924NRV Type

Depending on the type of installation the basic model can be equipped either with a mounting bracket for "wall installation", type A at page 5, or with a mounting bracket for "cover installation", type C at page 5.

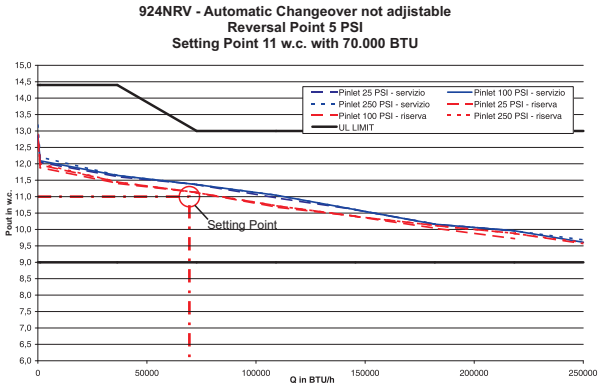
WARNING:

User manual is obligatory in case the regulator is directly sold to end user. The RV OEM must integrate their technical documentation with the provided instruction sheet.

The automatic changeover Type 924 NRV is connected to the RV through a flexible hose 501 LP Type. See Accessories at page 10.

Technical features:

Inlet connection:	¼ female NPT or inverted flare
Outlet connection:	3/8 NPT
Guaranteed Flow:	160000 BTU/h
Setting Point:	11 WC +/- 1 at 70000 BTU
Inversion Pressure:	5 PSI (0.35 bar)
Adjustable outlet pressure:	from -0.5 WC to +1.5 WC
Paint:	metallic grey
Cover and body:	Zamak Alloy 13 EN 1774
Working temperature range:	-4°F -122°F (-20°C-50°C)


924NRV - Automatic Changeover not adjistable
Reversal Point 5 PSI
Setting Point 11 w.c. with 70.000 BTU
Pinlet 25 PSI - servizio
Pinlet 100 PSI - servizio
Pinlet 250 PSI - servizio
Pinlet 25 PSI - riserva
Pinlet 100 PSI - riserva
Pinlet 250 PSI - riserva
UL LIMIT
Setting Point
Pout in w.c.
Q in BTU/h

Recreational vehicles

Bracket with protective cover installation

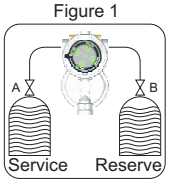
Wall mounted installation

4.1 Start up and usage

How to turn it on

- Make sure that the Automatic Changeover is connected to the two tank valves with high pressure gas hose. Make sure that the automatic changeover is mounted above the two tank valves. Open the two tank valves at the same time. This is fundamental to allow the automatic changeover to ensure the continuous functioning of the gas installation, in case one of the two cylinder tanks goes empty. The automatic changeover cannot namely pass to the reserve gas tank, if the tank valve is closed.

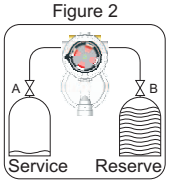
Figure 1



How to read the automatic changeover indicator: full gas tank

- When both gas tanks are full, the changeover indicator becomes green, provided that both tanks A and B valves are turned on.
- The arrow on the hand-wheel indicates which of the two bottles is used first, this becomes the "service bottle". The other gas cylinder is called "reserve bottle". See picture 1.

Figure 2



How to read the automatic changeover indicator: empty gas tank

- When the «service bottle» exhausts, the automatic changeover gets the sense negative pressure (gas bottle pressure less than 5 PSI). And automatically switches to the reserve bottle to supply the gas installation as normal. The end user will knows that the service bottle is now empty understands such operation because the green because indicator turns red. See picture 2.

How to substitute the empty gas tank with the full one

- Turn the tank valve A off and rotate the automatic changeover hand-wheel 180° (picture 3a). If the reserve gas tank is full, the indicator will turn green (picture 3b).
- Remove the empty gas tank (picture 3c).
- Install a full gas bottle and make sure to connect the same to the automatic changeover. Then turn on the cylinder valve A (picture 3d).

Figure 3a

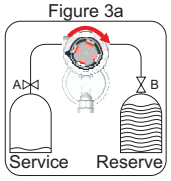


Figure 3b

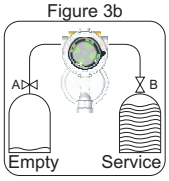


Figure 3c

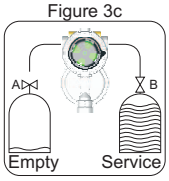
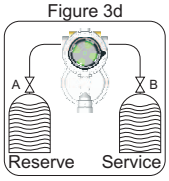


Figure 3d



4.2 Advantages of the automatic changeover Type 924 NRV

Easy-to-read changeover indicator

The indicator displays the two different ways of functioning Service/Reserve by changing colour. Reading the indicator colour is fundamental for the user because he is able to know when to proceed to replace the empty gas tank with the reserve gas tank. The indicator is designed to guarantee the best reading as possible:

* Far away visibility
* Frontal visibility
* Lateral visibility

Integrated "Back-flow check" device

As the "back-flow check" device is integrated in the automatic changeover 924 NRV Type, the user can apply gas high pressure hoses which are not equipped with their own back-flow check device. This always provides safety installation, even if the user replaces gas rubber hoses.

Automatic changeover inversion pressure value

The automatic changeover has to let the service cylinder get exhausted before inverting to the reserve gas tank. The automatic changeover performs even better at low pressure.

In fact the automatic changeover Type 924 NRV is designed to work with a pressure of inversion at 5 PSI (0.35 bar). This means that the inner pressure of the service gas cylinder must flow below 5 PSI to make the changeover begin to extract gas from the reserve bottle.

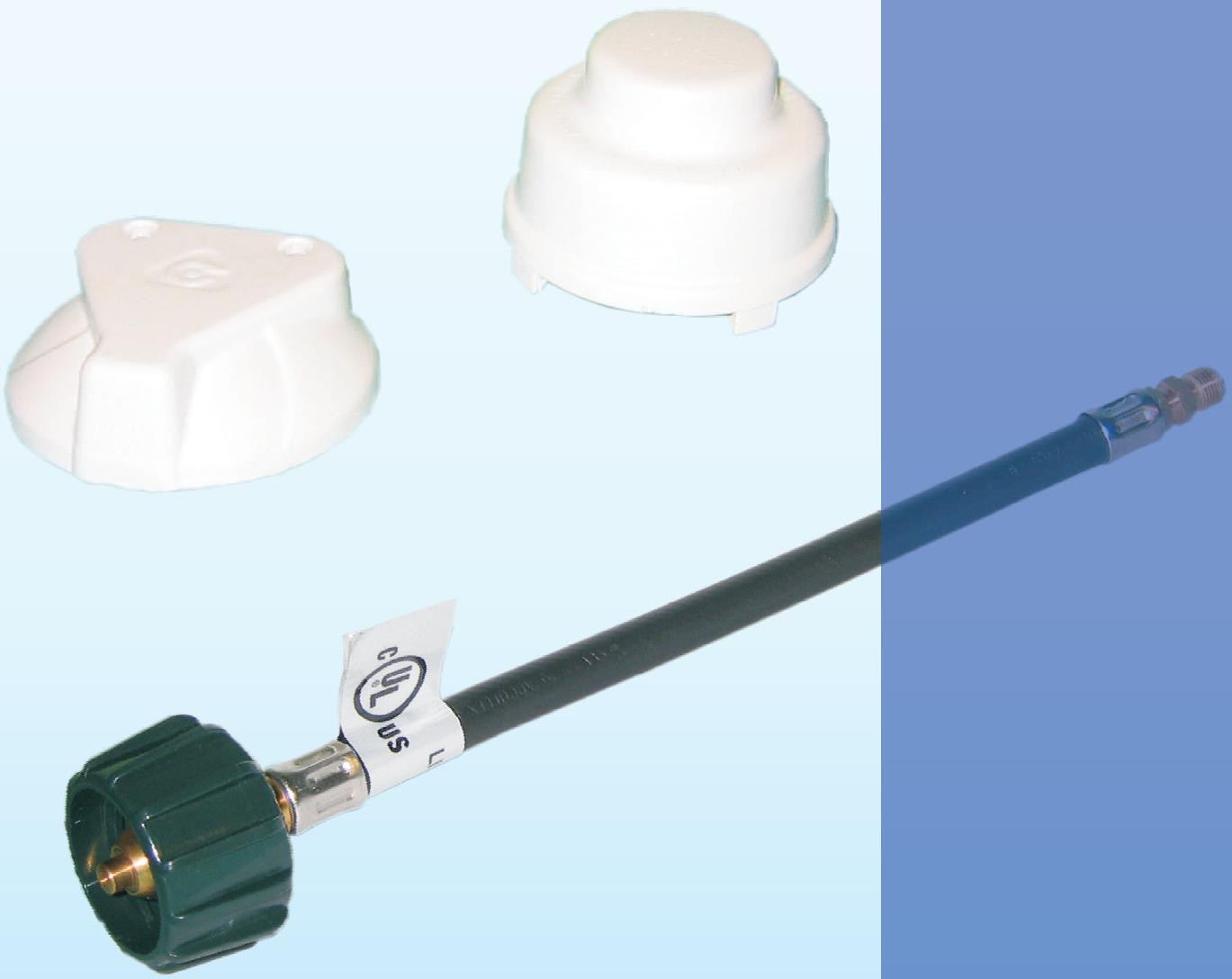
At this pressure value we know in fact that a propane gas bottle can be considered empty, whichever capacity or temperature functioning conditions the appliance is designed for.

Remote sound signal -optional only-

All 924 NRV type changeovers are equipped with a magnetic component placed below the hand-wheel. Thanks to this an optional electronic sound device can be mounted on the hand-wheel, allowing the end user to hear the sound when the installation is running with the "reserve" gas tank. Thus the end user knows he/she has to replace the empty gas tank at the earliest. For more information please call the nearest RV dealer.

Recreational Vehicles

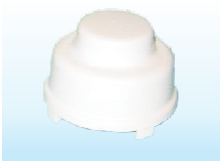
ACCESSORIES



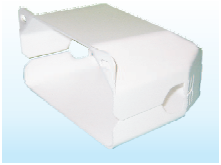
5. ACCESSORIES

5.1 Vent cover Type 211

Model 211-184 - Protection cover on the second stage of two stage 424 NRV regulator.

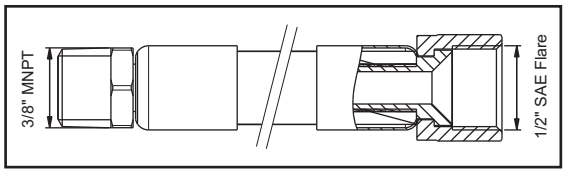


Model 211-161 - Protection cover for vent hole on the second stages of two stage 424 NRV and Automatic Changeover 924NRV regulators.



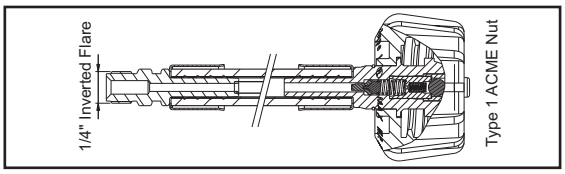
Model 211-086 - Complete protection cover for Two Stage ASME Type 524 AS.

5.2 Flexible hose Type 501 LP

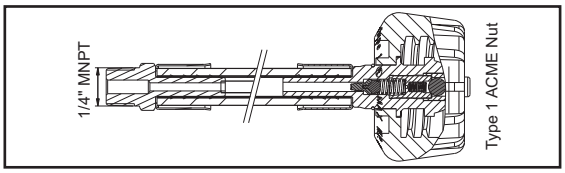


Model 501-007
3/8" I.D. hose, 3/8" MNPT x 1/2" SAE Flare

5.3 Flexible hose Type 501 HP



Model 501-005
1/4" I.D. hose, Type 1 ACME Nut x 1/4" Inverted Flare

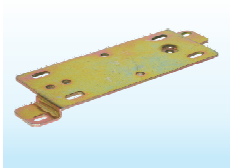


Model 501-006
1/4" I.D. hose, Type 1 ACME Nut x 1/4" MNPT

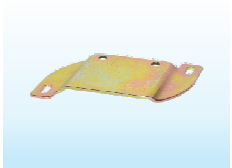
5.4 T-Check Type 413

Model 413-007 - To be used in double cylinder installations, mounted at the inlet of Two Stage 424NRV. In installations equipped with T-Check standard flexible hoses can be used.

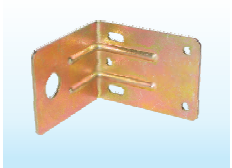
5.5 Mounting brackets Type 171



Model 171-059 - Wall installation manifold, designed for changeover Type 942 NRV only.

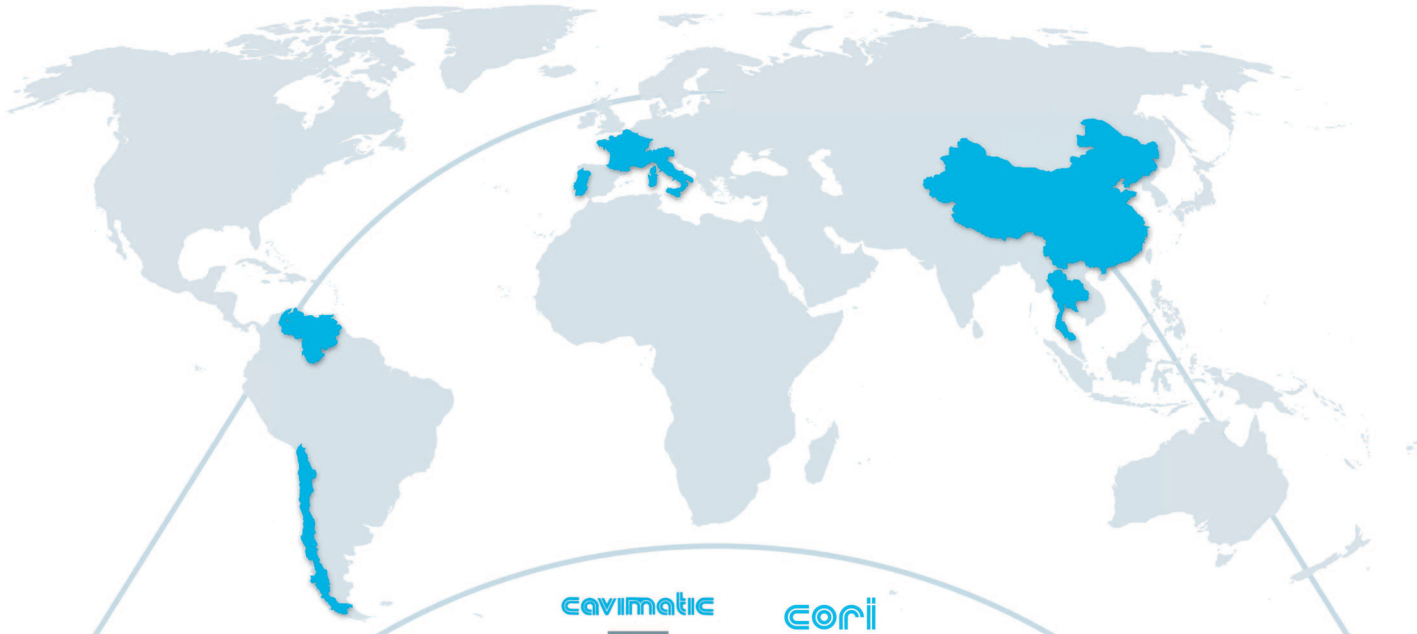


Model 171-061 - Wall installation manifold for twin regulator Type 424 NRV only.



Model 171-067 - Cover installation manifold for both twin regulator Type 942 NRV and changeover Type 424 NRV.

Manufacturing Facilities



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